AMENDMENTS TO THE SPECIFICATION:

Page 15, insert the following paragraph between the first full paragraph and the paragraph bridging pages 15 and 16 (i.e., between lines 17 and 19):

T-junction 118 is located downstream of autosampler 102 and peristaltic pump 114. Consequently, inlet port 120 receives, from autosampler 102 via peristaltic pump 114, a first fluid flow stream containing gas-separated samples, while inlet port 128, receives particles 124 from reservoir 122 via pump 114. Particles 124 and the gas-separated samples from autosampler 102, after being initially brought into contact and mixed in the reaction zone comprising T-junction 118, mix further during transit along tube 136 and react therein to form reaction products analyzable by flow cytometer detector 140.

Page 16, insert the following paragraph between the first full paragraph and the second full paragraph (i.e., between lines 11 and 13):

Y-junction 218 is located downstream of autosampler 202 and peristaltic pump 214. Consequently, inlet port 220 receives, from autosampler 202 via peristaltic pump 214, a first fluid flow stream containing gas-separated samples, while inlet port 228, receives particles 224 from reservoir 222 via pump 214. Particles 224 and the gas-separated samples from autosampler 202, after being initially brought into contact and mixed in the reaction zone comprising Y-junction 218, mix further during transit along tube 236 and react therein to form reaction products analyzable by flow cytometer detector 240.

AMENDMENTS TO THE CLAIMS:

1. (currently amended) A microfluidic mixing apparatus comprising:

first driving means for driving a plurality of reagent samples from a plurality of respective source wells into a first fluid flow stream;

second driving means for introducing a separation gas between each of said plurality of reagent samples in said first fluid flow stream to produce a gas-separated first fluid flow stream;

means for driving a second fluid flow stream comprising a plurality of particles;

a junction device downstream of said first driving means and said second driving means, said junction device comprising:

a first inlet port for receiving said gas-separated first fluid flow stream;

a second inlet port for receiving said second fluid flow stream;

a first reaction zone for forcing an initial mixing between said gas-separated first fluid flow stream and said second fluid flow stream to thereby form a reaction product

stream; and

an outlet port for allowing said reaction product stream to exit said junction device;

a second reaction zone downstream of said junction device where said plurality of reagent samples and said plurality of particles further mix [[to]] and form a plurality of reaction products, said second reaction zone communicating with said outlet port; and

~~reaction product driving means for driving said reaction product stream through said reaction zone; and~~

means operatively connected to said outlet port and said second reaction zone for selectively analyzing said reaction product stream for said reaction products.

2. (original) The microfluidic mixing apparatus of claim 1, wherein said first driving means comprises an autosampler.

3. (original) The microfluidic mixing apparatus of claim 2, wherein said autosampler includes a probe and said microfluidic mixing apparatus includes a means for exposing a probe tip of said. probe to a jet of gas to remove liquid from said probe tip.

4. (original) The microfluidic mixing apparatus of claim 2, wherein said autosampler includes a probe having a conical tip.

5. (original) The microfluidic mixing apparatus of claim 2, wherein said autosampler includes a hydrophobic probe.

6. (original) The microfluidic mixing apparatus of claim 5, wherein said probe comprises a hydrophobic material.

7. (original) The microfluidic mixing apparatus of claim 5, wherein said probe is coated with a hydrophobic material.

8. (original) The microfluidic mixing apparatus of claim 2, wherein said first driving means further comprises a first fluid flow stream peristaltic pump.

9. (original) The microfluidic mixing apparatus of claim 8, wherein a portion of said fluid flow stream passing through said first fluid flow stream peristaltic pump is contained within a high speed multi-sample tube.

10. (currently amended) The microfluidic mixing apparatus of claim 8, wherein said first fluid flow stream peristaltic pump is located along said first fluid flow stream between said autosampler and said junction device.

11. (original) The microfluidic mixing apparatus of claim 8, wherein said second

driving means comprises a second fluid flow stream peristaltic pump.

12. (original) The microfluidic mixing apparatus of claim 11, wherein a portion of said second fluid flow stream passing through said second fluid flow stream peristaltic pump is contained within a high speed multi-sample tube.

13. (original)The microfluidic mixing apparatus of claim 11, wherein said first fluid flow stream peristaltic pump and said second fluid flow stream peristaltic pump comprise the same peristaltic pump.

14. (original) The microfluidic mixing apparatus of claim 1, wherein said reaction product driving means comprises said first driving means and said second driving means.

15. (original) The microfluidic mixing apparatus of claim 14, wherein said first driving means, said second driving means and said reaction product driving means comprises the same peristaltic pump.

16. (original) The microfluidic mixing apparatus of claim 1, further comprising a first tubing for containing said first fluid flow stream, a second tubing for containing said second fluid flow stream and a reaction product tubing for containing said reaction product stream.

17. (original) The microfluidic mixing apparatus of claim 16, wherein said microfluidic mixing apparatus includes a unibody flow apparatus comprising said first tubing, said second tubing, said reaction product tubing, and said junction device.

18. (original) The microfluidic mixing apparatus of claim 16, wherein said first tubing comprises high speed multi-sample tubing.

19. (original) The microfluidic mixing apparatus of claim 18, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.005 to about 0.02

inches and a wall thickness of about 0.01 to about 0.03 inches.

20. (original) The microfluidic mixing apparatus of claim 18, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.01 inches and a wall thickness of.about 0.01 to about 0.03 inches.

21. (original)The microfluidic mixing apparatus of claim 16, wherein said second tubing comprises high speed multi-sample tubing.

22. (original) The microfluidic mixing apparatus of claim 21, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.005 to about 0.02 inches and a wall thickness of about 0.01 to about 0.03 inches.

23. (original) The microfluidic mixing apparatus of claim 21, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.01 inches and a wall thickness of about 0.01 to about 0.03 inches.

24. (original) The microfluidic mixing apparatus of claim 16, wherein said reaction product tubing comprises high-speed multi-sample tubing.

25. (original) The microfluidic mixing apparatus of claim 24, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.005 to about 0.02 inches and a wall thickness of about 0.01 to about 0.03 inches.

26. (original) The microfluidic mixing apparatus of claim 24, wherein said high speed multi-sample tubing comprises PVC tubing having an inner diameter about 0.01 inches and a wall thickness of about 0.01 to about 0.03 inches.

27. (original) The microfluidic mixing apparatus of claim 1, wherein said first inlet port, said second inlet port and said outlet port each have an inner diameter about 0.005 to about 0.02

inches.

28. (original) The microfluidic mixing apparatus of claim 1, wherein said first inlet port, said second inlet port and said outlet port each have an inner diameter about 0.01 inches.

29. (original) The microfluidic mixing apparatus of claim 1, wherein said separation gas comprises air.

30. (original) The microfluidic mixing apparatus of claim 1, wherein said plurality of reagent samples are homogenous.

31. (original) The microfluidic mixing apparatus of claim 1, wherein said plurality of reagent samples are heterogeneous.

32. (original) The microfluidic mixing apparatus of claim 1, wherein said particles comprise biomaterials.

33. (original) The microfluidic mixing apparatus of claim 32, wherein said biomaterials are fluorescently tagged.

34. (original) The microfluidic mixing apparatus of claim 1, further comprising a well plate including said plurality of respective source wells.

35. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes at least 60 source wells.

36. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes at least 72 source wells.

37. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes at least 96 source wells.

38. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes at least 384 source wells.

39. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes at least 1536 source wells.

40. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate includes wells having a conical shape.

41. (original) The microfluidic mixing apparatus of claim 34, wherein said well plate is mounted in an inverted position.

42. (original) The microfluidic mixing apparatus of claim 1, further comprising a means for injecting a buffer fluid between adjacent reagent samples in said first fluid flow stream.

43. (original) The microfluidic mixing apparatus of claim 1, wherein at least one of said plurality of reagent samples comprises a drug.

44. (original) The microfluidic mixing apparatus of claim 1, wherein said junction device is Y-shaped.

45. (original) The microfluidic mixing apparatus of claim 44, wherein the angle between any two of said first inlet port, said second inlet port and said outlet port is 120°.

46. (original) The microfluidic mixing apparatus of claim 1, wherein said junction device is T-shaped.

47. (original) The microfluidic mixing apparatus of claim 1, further comprising a first inlet

tube connected to said first inlet port, a second inlet tube connected to said second inlet port and an outlet tube connected to said outlet port, wherein said first inlet tube and said first inlet port have the same inner diameter, wherein said second inlet tube and said second inlet port have the same inner diameter, and said outlet tube and said outlet port have the same inner diameter.

48. (original) The microfluidic mixing apparatus of claim 47, wherein said first inlet port, said second inlet port and said outlet port each have the same interior diameter.

49. (original) The microfluidic mixing apparatus of claim 47, wherein said first inlet port and said second inlet port have the same inner diameter and said outlet port has a different inner diameter from said first inlet port and said second inlet port.

50. (original) The microfluidic mixing apparatus of claim 49, wherein said outlet port has a larger inner diameter than said first inlet port and said second inlet port.

51-78. (canceled)